

Exhibit 3



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Computer Expert Report

C. Matthew Curtin, CISSP

Date: 2015/03/13 21:10:55

I AM THE FOUNDER of Interhack Corporation ("Interhack"). Interhack is a privately-held expert firm with practices covering cybersecurity and forensic computer analysis. A true and accurate representation of my testimony history, academic appointments, publications, and other relevant background are available in my curriculum vitae, attached as Appendix A. I am supported by Interhack staff working at my direction and under my supervision.

The law firms of Grant & Eisenhofer P.A., Gardy & Notis LLP, and Bursor & Fisher P.A. engaged Interhack to perform a forensic analysis of data, software specifications, and other documentation related to *In re Google Privacy Policy Litigation*. I reserve the right to make additional declarations in this matter as more data become available.

The fees for this engagement are charged hourly in accordance with a signed engagement letter. My fee for analysis is \$425 per hour, and for testimony delivered live is \$605 per hour. Other Interhack staff supporting me bill at lower rates. Payment for work performed in this engagement is not contingent on the outcome of the matter.

This analysis is based upon sources available to me, including those designated CONFIDENTIAL or CONFIDENTIAL OUTSIDE COUNSEL ONLY under the Protective Order, identified here as [COCO], namely:

1. *Android Market: Now available for users* (GOOG-00000001-02);
2. *Package: android.drm* (GOOG-00000003-07);
3. *App Purchase Flows* (GOOG-00000008-21) [COCO];
4. *public class DownloadManager* (GOOG-00000022-32);
5. *Finsky—Free Application Install Flow* (GOOG-00000033-37) [COCO];
6. Flow diagram of first and further installations of free and paid apps (GOOG-00000038) [COCO];

7. *Finsky Universal Store* (GOOG-00000039-42) [COCO];
8. *Finsky/Checkout Integration* (GOOG-00000043-68) [COCO];
9. *Form of Payment* (GOOG-00000069-85) [COCO];
10. *Introducing Google Play: All your entertainment, anywhere you go* (GOOG-00000086-94);
11. *Google Play Purchases* (GOOG-00000095-125) [COCO];
12. *KYC Explained* (GOOG-00000126-129) [COCO];
13. *Reliable Notifications for the Finsky Client* (GOOG-00000130-132) [COCO];
14. *Life of a Google Play purchase* (GOOG-00000133-193) [COCO];
15. *Unified Play Store User Library* (GOOG-00000194-212) [COCO];
16. *Whisky Deployment and GAIA Service* (GOOG-00000213-225) [COCO];
17. *Customer Marketing 2014 Owning the Android User* (GOOG-00000226-267) [COCO];
18. *Purchase Flow for Finsky Tablet Client App* (GOOG-00000268-292) [COCO];
19. "Buyflow" documentation (GOOG-00000293-306) [COCO];
20. "Buyflow" documentation (GOOG-00000307-326) [COCO];
21. "Buyflow" documentation (GOOG-00000327-355) [COCO];
22. "Buyflow" documentation (GOOG-00000356-394) [COCO];
23. "Buyflow" documentation (GOOG-00000395-433) [COCO];
24. "Buyflow" documentation (GOOG-00000434-459) [COCO];
25. "Buyflow" documentation (GOOG-00000460-489) [COCO];
26. Deposition of Ficus Kirkpatrick, 21 Jan 2015 [COCO];
27. Notice of Deposition of Defendant Google, Inc. Pursuant to Fed. R. Civ. P. 30(b)(6);
28. Plaintiffs' Second Set of Requests for Production to Defendant Google, Inc.;
29. Defendant Google Inc.'s Responses and Objections to Plaintiffs' Fourth Set of Interrogatories; and

30. Letter from Michael H. Page to Kyle J. McGee dated March 12, 2015 regarding API changes (with attachment [COCO]).

I offer expert opinions in this matter after analysis of the data.

1. Between February 2009 and May 2014, Google published to third parties the names, email addresses, and locations of users that purchased content such as Android applications in the *Google Play*¹ store.
2. The disclosure to developers of the names, email addresses, and locations of users that made a purchase in the *Google Play* store is not a technical requirement to completing a purchase transaction nor for the delivery of content to the user.
3. The purchase process includes publication of buyers' information to developers. The business logic implemented by user interfaces such as *Google Play Developer Console* and *Google Checkout Merchant Center* causes a user's name, email address, and location to be published once a purchase is made by the user in *Google Play*.
4. The process of completing a purchase in the store now branded as *Google Play* consumes limited resources local to or used by the purchaser's device.

¹ *Google Play* is used to mean the Google service by this name as well as prior brand names for the same service such as the *Android Market*.

Introduction

In support of its Android operating system platform, Google maintains a marketplace allowing users to easily purchase applications and other electronic content for use on the Android platform. This marketplace was initially created in late 2008 under the name *Android Market* and subsequently renamed *Google Play*.² *Android Market* and *Google Play* are "principally the same product with a new name."³

The *Google Play* marketplace allows third-party application developers and other content publishers to make items available for sale.⁴ Google provides these third-parties with two front-end interfaces, *Google Play Developer Console* and *Google Checkout Merchant Center*, with which they can publish content, see purchase history, and download purchase detail.⁵

The *Google Play* architecture uses other components set up by Google to support other service offerings. For example, a user wishing to make purchases from *Google Play* must have a *Google* account. This account is not specific to the *Google Play* marketplace

² GOOG-00000001-02

³ Deposition of Ficus Kirkpatrick, 21 Jan 2015 pp. 41-42

⁴ GOOG-00000001-02

⁵ Deposition of Ficus Kirkpatrick, 21 Jan 2015 p. 77 and pp. 79-81

but is a common profile used for other services such as *Google Drive* and *GMail*.⁶ The common user profile maintained by Google may contain data fields to include a user's name, email address, and location.⁷

An Android user interacts with the *Google Play* marketplace using either a web browser or a dedicated *Google Play* application.⁸ As a prerequisite to making a purchase, the user must have authenticated to Google using their Google account.⁹ When a purchase is made, databases are updated at Google and on the user's Android device in order to reflect the purchase transaction and that the user, as identified by their Google account, has the right to download the purchased content.¹⁰

None of the databases storing data values associated with the purchase of content from *Google Play* are directly accessible by Google users.¹¹ Google provides specific users permission to view limited data values stored in these databases through interfaces such as the *Google Play Developer Console* and the *Google Checkout Merchant Center*. The specific values that are permitted to be viewed by users of these interfaces are defined by business logic defined by Google and embodied by code implemented by its engineers. All access to data stored in Google's databases are mediated by code meant to enforce business logic defined by Google.¹²

Google Publishes Buyers' Information to Developers

Between February 2009 and May 2014, a developer using the *Google Play Developer Console* or *Google Checkout Merchant Center* would have been able to view the names, email addresses, and locations of those users that purchased content published by the developer.¹³

Those users that purchased applications through *Google Play* were not provided a mechanism by which to opt-out or otherwise prevent their information from being made available through the *Google Play Developer Console*.¹⁴

Providing content to the Web has long been recognized as publishing. Using security controls to protect data published in this manner has likewise been recognized from the earliest days of the medium.¹⁵ Specifically, publication in this matter occurred when Google made buyer names, email addresses, and location available to developers.

Mr. Kirkpatrick testified that he was involved in a decision to stop including names and email addresses in the developer console.¹⁶

⁶ Deposition of Ficus Kirkpatrick, 21 Jan 2015 pp. 54-55

⁷ Deposition of Ficus Kirkpatrick, 21 Jan 2015 pp. 56-57

⁸ Deposition of Ficus Kirkpatrick, 21 Jan 2015 p. 141 and pp. 152-154

⁹ Deposition of Ficus Kirkpatrick, 21 Jan 2015 p. 54

¹⁰ Deposition of Ficus Kirkpatrick, 21 Jan 2015 87-90

¹¹ Deposition of Ficus Kirkpatrick, 21 Jan 2015 pp. 64-65

¹² *Ibid.*

¹³ Deposition of Ficus Kirkpatrick, 21 Jan 2015 pp. 72-73, 81, 182-183

¹⁴ Deposition of Ficus Kirkpatrick, 21 Jan 2015 p. 214

¹⁵ W3C. Putting information onto the web, April 1995. URL <http://www.w3.org/Provider/>. Accessed July 13, 2012; and

¹⁶ Deposition of Ficus Kirkpatrick, 21 Jan 2015 p. 73

Modifications to prevent the disclosure of buyer names and email addresses were made to the code supporting the *Google Play Developer Console* in May 2014.¹⁷

Google Play continued to make content available for sale and process transactions even after changes were made to prevent disclosure of the names and email addresses of those purchasing content.¹⁸

¹⁷ Deposition of Ficus Kirkpatrick, 21 Jan 2015 pp. 73 and 81

¹⁸ Deposition of Ficus Kirkpatrick, 21 Jan 2015 p. 73

Publishing Buyers' Information Unnecessary for Purchase

Relying upon my experience developing software and in the field of computer security, I conclude that there is no technical reason or requirement that would have necessitated the disclosure of buyer name, email addresses, or location to developers.

Purchase Process Includes Publication

A user that creates a Google account implicitly receives an email address.¹⁹

When a user or their device performs certain interactions with Google's servers, they will not be required explicitly to transmit or to provide a name, email address, or location to Google's server because a mapping between these data and Google account identifiers is maintained in Google databases.²⁰

¹⁹ Deposition of Ficus Kirkpatrick, 21 Jan 2015 p. 57

The name, email address, and location stored by Google and associated with a user's Google account was made available to a developer account only after a user made a purchase of content published by the developer in the *Google Play* store. This practice continued between February 2009 and May 2014.²¹

²⁰ Deposition of Ficus Kirkpatrick, 21 Jan 2015 pp. 56-57

Mr. Kirkpatrick testified, "so when the user makes an order or makes a purchase, you know, as part of the process of making that purchase, we create a record of that purchase. So an order or an item in the purchase history, that data is available for the Developer Console to read."²²

²¹ Deposition of Ficus Kirkpatrick, 21 Jan 2015 pp. 71-73 and 74-75

Purchasing content from *Google Play* is an integrated operation with multiple components that work together to form an cohesive, tightly-coupled process.

²² Deposition of Ficus Kirkpatrick, 21 Jan 2015 pp. 86-87

Purchase Process Consumes Android Device Resources

Devices such as mobile phones, tablets, laptops, workstations, and other computing devices use measured or limited resources when communicating with *Google Play* servers over the Internet in the course of making a purchase. Resources used during this interaction include:


1. Electric power;
2. CPU cycles;
3. Main memory; and
4. Network capacity.

Indeed, Mr. Kirkpatrick testified that while making a purchase through *Google Play*, code running on the a user's device will use resources such as:

1. "electricity";
2. "battery";
3. "CPU";
4. "RAM"; and
5. "network."²³

²³ Deposition of Ficus Kirkpatrick, 21 Jan 2015
pp. 156-157

I DECLARE THAT THE FOREGOING is correct. Signed this thirteenth day of March, 2015.



C. Matthew Curtin

Bibliography

HTTP Working Group. Hypertext transfer protocol – http/1.0, 1996. URL <http://www.w3.org/Protocols/HTTP/1.0/spec.html>.

W3C. Putting information onto the web, April 1995. URL <http://www.w3.org/Provider/>. Accessed July 13, 2012.



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C. Matthew Curtin

Summary of Expertise

Computer Science in Adjudication

Active as a forensic computer scientist since early 2000. Experience includes routine electronic discovery, litigation consulting, and work as an expert witness in civil, criminal, and administrative actions. Frequently deliver CLE and CJE credit seminars to attorneys and judges on the use of electronic information in adjudication.

Cybersecurity

Consultant to complex information security projects involving incident response, regulatory compliance, and analysis of security program and control effectiveness. Responsible for design and implementation of early Internet and Web security systems.

Operating Systems

Extensive experience in systems implementation, drawing upon theory and practice of operating systems. Applications include customization to optimize function, user experience, security, and performance. Experience teaching operating systems implementation at the university level.

Programming Languages

Broad experience in many languages including Lisp, Perl, Java, C, various languages for UNIX systems, data processing, text markup, and more. Fifteen years' experience teaching use of programming languages at university level.

Protocols

Expert in many widely-used Internet protocols, including development of systems using a variety of networking protocols, and participation in standards-setting workgroups.

Experience

| | |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|
| Interhack Corporation Founder, CEO | 1997–Present |
| Founded and built firm from self-funded research group to for-profit consulting firm with practice areas in cybersecurity and computer expert services. Some highlights include: | |
| <ul style="list-style-type: none"> • Analysis of Data Loss Incidents Coauthored original research showing how data loss incidents take place broadly and per industry. | <i>Research</i> |
| <ul style="list-style-type: none"> • High-Profile Incident Response and Security Assessment Led external assessment teams for a data loss incident at the Ohio Administrative Knowledge System (OAKS), a large-scale ERP system for the entire State government. | <i>Consulting</i> |
| <ul style="list-style-type: none"> • Enterprise Data Encryption Provided technical expertise to multibillion-dollar retailer developing cryptographic controls for the protection of cardholder and other sensitive information. | <i>Consulting</i> |
| <ul style="list-style-type: none"> • Sony “Rootkit” Digital Rights Management Served as technical consultant to plaintiff’s counsel in civil proceedings over the 2005 DRM released on Sony Music CDs. | <i>Litigation Consulting</i> |
| <ul style="list-style-type: none"> • Pharmatrak Privacy Litigation Assessed Web traffic analysis system for civil privacy litigation and provided opinion used by the U.S. Court of Appeals for the First Circuit to establish precedent on the application of Federal wiretap statutes to Web technology. | <i>Expert Testimony</i> |
| The Ohio State University, Department of Computer Science and Engineering | 1998–2014 |
| <ul style="list-style-type: none"> • Sr. Lecturer Taught the CSE 4254 semester-long course “Programming in Lisp,” giving students with experience programming an understanding of the Common Lisp programming language. | 2013–14 |
| <ul style="list-style-type: none"> • Lecturer Taught the CSE 459.31 course “Programming in Lisp,” intended to give students a basic understanding and familiarity with the Common Lisp programming language. Taught the CIS 662 course “Operating Systems Laboratory,” a course on the design and implementation of operating systems, where students build their own operating systems code. For graduate students and majors focusing in operating systems. | 1999–2012 |

- Senior Systems Developer/Engineer 1998–2000
Lead department software development efforts, maintain open source software, and provide technical assistance throughout the department in systems, software, and documentation. Instituted department software development process. Provide technical and career mentoring to other staff members.
- Original Faculty Advisor of student groups Buckeye Privacy Coalition and Open Source Club.

Megasoft Online Chief Scientist 1996–1998

Provided technical leadership to Megasoft's development, engineering, and Information Systems groups in areas ranging from system and network security to design, implementation, and management of distributed software.

Led research efforts that improved the *Web Transporter* product's scalability, reliability, and security. Developed new cryptographic protocol to allow HTTP caches to work normally without sacrificing the security of encrypted links. Also designed and led the implementation of the LDAP directory interface for *Web Transporter*.

Fahlgren Inc. Chief Hacker 1996

Acted as technical resource for Interactive Design Group and Information Systems. Worked with Web site design group, providing expertise in Web site design, and technical issues related to site management and engineering. Also responsible for design and implementation of Fahlgren's Internet firewall.

AT&T Bell Laboratories Contractor 1995–1996

Worked with the Internet gateway group responsible for providing Internet connectivity to AT&T throughout the entire world, providing expertise in the areas of security, large scale system administration, and Internet software development. Led efforts to redesign and implement the third generation of the AT&T firewall and automate the handling of work for att.com postmaster functions. Consulted to other business units in need of such expertise.

Largely responsible for the security of some of the most busy sites on the Web, including AT&T, Disney, and others.

Transamerica Real Estate Tax Service Ohio Division Data Processing Supervisor 1993–1995

Responsible for oversight of entire Ohio Division data processing operation, including management of DP and data

entry staff. Also served as a technical resource and systems software developer for the corporate internal software development group.

Books and Chapters for Books

- *Brute Force: Cracking the Data Encryption Standard* (Copernicus Books, 2005)
Discussion of first public brute force crack of a message encrypted with the (then) U.S. Government standard for data encryption, DES, a 1997 project led by Rocke Verser, Matt Curtin, and Justin Dolske.
- *Developing Trust: Online Privacy and Security* (Apress, 2001)
Discussion of privacy as an aspect of data security, case studies, and guidance for application developers to build systems that are more trustworthy, protecting privacy by design instead of only by policy.
- *The CPA's Guide to Information Security* (For AICPA by Kent Information Services, 1998)
Authored a chapter on secure networking and contributed technical material for a chapter on cryptography.
- *UNIX Unleashed, Internet Edition* (SAMS, 1997)
Authored chapters 17 and 19 in part, covering development of secure Web-based software using the Common Gateway Interface and the Perl programming language.

Refereed Papers and Formal Conference Work

- *Standardizing Breach Incident Reporting: Introduction of a Key for Hierarchical Classification*
Work-in-Progress paper in *Proceedings of the Systematic Approaches to Digital Forensic Engineering*, 2010. Coauthored with Lee T. Ayres and Thomas A. Ng.
- *Using Science to Combat Data Loss: Analyzing Breaches by Type and Industry*
In *I/S: A Journal of Law and Policy for the Information Society*, Volume 4, Issue 3, Winter 2008–09. Presentation of taxonomy to classify data loss incidents and study identifying the relationships between data loss types and industries.
- INFOSEC Forum VII General Chair, May 2005
Leading effort to present the seventh central Ohio INFOSEC Forum, with specific focus on developing more rigorous program content and broadening draw to state-wide.

- INFOSEC Forum VI General Chair, November 2004
Leading effort to present the sixth central Ohio INFOSEC Forum, with specific focus on developing more rigorous program content and broadening draw to state-wide.
- PrivacyCon 2003 Program Committee
Member of program committee for The Ohio State University Technology Policy Group (TPG) conference on privacy issues.
- LISA 2001 Program Committee (Reader)
Participated in review, commentary, and publication recommendation process for USENIX Large Installation System Administration conference (2001).
- *Pelendur: Steward of the Sysadmin*
In the Proceedings of LISA 2000. Overview of the design and implementation of the system for managing user accounts and department workflow developed at Ohio State's CIS department starting in 1998.
- *Shibboleth: Private Mailing List Manager*
In the Proceedings of the 9th USENIX Security Symposium. Description of a system for managing private and secure mailing lists in insecure environments.

Expert Testimony

- *State of Ohio v. Clay Hooper*, Court of Common Pleas of Perry County, Ohio, Case No. 14-CR-0037
2014-15
For defense counsel I analyzed the State's reports of forensic computer examination, performed independent analysis, and authored a report.
- *Meadowbrook, Inc. v. Kyle Biddinger, et al.*, United States District Court, Southern District of Ohio, Eastern Division, Case No. 1:14-cv-01374
2014-15
On behalf of Plaintiff's counsel, I examined computer data and completed a report of forensic analysis.
- *State of Ohio v. Charles E. Thomas*, Court of Common Pleas of Franklin County, Ohio, Case No.: 14 CR 004625
2014-15
Addressed questions regarding operation of peer-to-peer software *µTorrent* and relevant computer terminology in the form of an affidavit.

- *State of Ohio v. Michael McVey*, Court of Common Pleas, Jefferson County, Ohio, Case No.: 13-CR-228 2014–15

Evaluated reports offered by the State and data in relevant items in the prosecution of the superintendent of Steubenville City Schools. Provided affidavits and expert reports before all charges were dismissed by the State.
- *Shayne E. Thomas v. Lynn O. Radabaugh, et. al.*, Common Pleas Court of Seneca, Ohio, Case No.: 13CV0230 2014

Assessed availability of electronically stored information in an electronic discovery dispute.
- *St. Joseph Health System Medical Information Cases*, Superior Court of the State of California, County of Orange, Judicial Council Coordinated Proceeding No. 4716 2013–Present

For Plaintiff’s counsel I assessed data and testimony in connection with a data breach. I have offered a Declaration in the matter and have been deposed.
- *Champion Foodservice, LLC v. Vista Food Exchange, Inc., et al.*, United States District Court, Northern District of Ohio, Eastern Division, Case No. 1:13-CV-1195 2014–Present

For defense counsel I analyzed computer data and submitted a report and was deposed.
- *Douglas Lowe, et al. v. Allstate Property & Casualty Insurance Company, et al.*, Court of Common Pleas, Washington County, Ohio, Case No. 13 OT 13 2013–14

On behalf of plaintiff’s counsel I examined a mobile phone and gave a deposition regarding its data and interpretation.
- *State of Ohio v. Brandt Cook*, Municipal Court, Delaware, Ohio, Case No. 13CRB01400 2014

Engaged by counsel for the defendant, I examined images from a mobile phone and appeared at a hearing to address questions from counsel and the Court on the interpretation of electronic image data.
- *State of Ohio v. Michael E. Thomas*, Court of Common Pleas, Hancock County, Ohio, Case No. 2012 CR 286 2013–14

I examined a digital video recorder (DVR) unit connected to electronic video evidence and directed the effort to extract video from the broken storage device. I submitted an affidavit and testified at trial.
- *Paracap Group LLC, et al. v. Charles Crowley, et al.*, FINRA Dispute Resolution, FINRA-DR ARB. NO. 13-00584 2013–14

For Complainant’s counsel I analyzed computer systems to locate confidential information. I drafted a report in the matter and presented at an arbitration hearing.

- *Sue A. Farley et al. v. Complete General Construction Co., et al.*, Court of Common Pleas of Franklin County, Ohio 12 CV 012394 2014

For Plaintiff's counsel I analyzed a mobile phone and related records regarding activity during a period of time critical to the litigation. I submitted a letter stating findings and was deposed.
- *Flairsoft LTD., v. Yogesh Khandelwal, et al.*, Court of Common Pleas of Delaware County, Ohio, 11-CV-H-09-1107 2013–Present

For defense counsel I have analyzed the record regarding computer data and source code, and submitted affidavits.
- *H&H Industries, Inc. v. Erik S. Miller*, United States District Court, Southern District of Ohio, Eastern Division, Case No. 2:13-cv-907 2013–14

For plaintiff's counsel I examined computer systems and data to locate confidential information. To date I have submitted reports, been deposed, and appeared at hearings.
- *Robert A. Brown, et al. v. Tellermate Holdings Ltd., et al.*, United States District Court for the Southern District of Ohio, Eastern Division, Case No. 2:11-cv-1122 2013–Present

For plaintiff's counsel I assessed the ability to conduct electronic discovery of a cloud-based customer relationship management (CRM) system. To date I have completed reports and appeared in hearings.
- *Juana Curry and William Moore, et al. v. AvMed, Inc., d/b/a AvMed*, United States District Court For the Southern District of Florida, Case No. 10-cv-24513-JLK 2013

For plaintiff's counsel I determined costs associated with the selection and deployment of appropriate cryptographic controls to protect medical information.
- *Leland Small, et al. v. BOKF, N.A.*, United States District Court for the District of Colorado, Civil Action No. 13-cv-01125-REB-MJW 2013–Present

For plaintiff's counsel I assessed testimony regarding the type and availability of records, executed a declaration regarding the computability of a formula, and provided testimony in a deposition.
- *State of Ohio v. Matthew Fielding*, Court of Common Pleas, Franklin County, Ohio, Case No. 12 CR 2800 2012–13

I examined computer data on behalf of the defendant, provided a written report, and testified at trial.
- *Momentive Specialty Chemicals, Inc., v. Ricky Alexander*, United States District Court for the Southern District of Ohio, Eastern Division, Case No. 2:13-cv-275 2013

For plaintiff's counsel I assessed computer data and submitted documentation of my analysis.

- *State of Ohio v. James F. Morrison*, Court of Common Pleas, Delaware County, Ohio, Case No. 11CR-I-06-0302 2010–12

I examined computer data on behalf of the defendant, and provided an affidavit and testimony at the sentencing hearing.
- *Edward Haines, and Nyeta Haines, his wife v. Ann S. Mercer, M.D., Ann Shukri Mercer, M.D., P.A., State of New Mexico, County of Dona Ana, Third Judicial District, Case No. CV-2010-2273* 2012

For plaintiffs' counsel I have presented options to the Court for analysis of an electronic medical record.
- *Coast to Coast Health Care Services, Inc. v. Dawn Meyerhoffer and David G. Lovell, M.D. and Critical Access Solutions, Inc. and Daybreak Village, LLC and Tapestry Hospice, LLC, United States District Court for the Southern District of Ohio Eastern Division, Case No. 10-cv-00734* 2012–13

For plaintiff's counsel I analyzed computer data and submitted a report of my findings.
- *State of Ohio v. Stephen P. Harris*, State of Ohio, Warren County Common Pleas Court Criminal Division, Case No. 11CF27938 2011–12

For defense counsel I analyzed data and presented a report.
- *United States of America v. Matthew Howard Saffel*, United States District Court for the Southern District of Ohio, Eastern Division, Case No. 2:10-cr-00238 2010–11

For defense counsel I assessed data and provided an affidavit entered at the sentencing hearing.
- *State of Ohio v. Christopher J. Renkes*, Court of Common Pleas, Delaware County, Ohio, 10CR-I-04-0235 2011

I examined computer data on behalf of the defendant, provided a report, and appeared at trial.
- *State Farm Fire & Casualty Company v. Joseph Martin Radcliff, Coastal Property Management LLC, a/k/a CPM Construction of Indiana, Jacob Charles Piper, Reginald Rex Thoman, Eric M. Dieckman, Matthew P. Seaver, Ryan M. Murphy, and Michael Henderson*, State of Indiana, Hamilton County In the Hamilton Superior Court No. 1 2011

On behalf of the plaintiff, I analyzed electronic data from a mobile device and provided an expert report. I have been deposed in the matter.
- *Peoples Bank, National Association v. Robert Daniel Coffill, Jr.*, Court of Common Pleas, Fairfield County, Ohio 2010

On behalf of the plaintiff, I analyzed electronic information and provided an affidavit regarding key findings.

- *The Estate of John Hiotis, by and through Maria Hiotis v. 2600 Highlands Boulevard, North, LLC A/K/A 2600 Highlands Boulevard, North, LLC D/B/A/ Bay Tree Rehabilitation and Nursing Center; Florida Holdings III, LLC; Florida Administrative Services, LLC; Harborside Healthcare Corporation; Harborside Administrative Services, LLC; Sharon Harris; Samuel Politz; Alan Cooper A/K/A Alan Peter Cooper; Dennis Deshong; Daniel Frenden A/K/A Daniel L. Frended; Myra Marcum A/K/A Myra Joyce Marcum (as to Bay Tree Rehabilitation & Nursing Center)*, Circuit Court of the Sixth Judicial Circuit in and for Pinellas County (Florida), Case No. 08-2042-CI; Division 8 2010–11

On behalf of defense counsel, I reviewed discovery documents, discussed data management practices with staff, and submitted an affidavit.

- *John W. Ferron v. MetaReward, Inc., et al.*, United States District Court for the Southern District of Ohio, Eastern Division, Civil Action Nos. 2:09-cv-430, 2:09-cv-440, 2:09-cv-512, 2:09-cv-513, 2:09-cv-520 2009–10

For defense counsel I consulted on ESI and computer technology. I submitted an affidavit for the Court.

- *Robert Schmidt v. AT&T, Inc. and SBC Internet Services, Inc. d/b/a AT&T Internet Services, Inc.*, Court of Common Pleas, Cuyahoga County, Ohio, Case No. CV 2009 6887885 2010

This action is pending. For intervenors' counsel I submitted an affidavit as to my work in the matter of *Ford, Dunne, Bell, and Klorer v. SBC Communications Inc. and SBC Internet Services, Inc. d/b/a AT&T Internet Services, Inc.*, described below.

- *In re Mark A. Williams*, Ohio Department of Education Administrative Procedure 2009

For respondent's counsel I assessed computer data presented as evidence by complainant, presented a report, and testified at a hearing.

- *Gail Ford, Carrie A. Dunne, John E. Bell, and Patricia A. Klorer v. SBC Communications Inc. and SBC Internet Services, Inc. d/b/a AT&T Internet Services, Inc.*, Circuit Court of St. Louis County (Missouri) Cause No. 06CC-003325, Division No. 6 2008–12

This action is pending. For plaintiff's counsel I assessed computer data connected to the billing and delivery of broadband Digital Subscriber Line service. I have submitted an affidavit in the matter.

- *New York Stock Exchange Specialists Litigation*, U.S. District Court, Southern District of New York, 405 F. Supp. 2d 281 2007–Present

This action is pending. On behalf of plaintiff's counsel, I led the team that developed software to analyze New York Stock Exchange trading data to identify trades according to specifications of market experts. To date I have submitted two expert reports and have been deposed.

- *The Estate of Elizabeth Kiricenkov, by and through Rita K. Browning and George J. Kiricenkov, Co-Executors de son Tort v. Seminole Properties; Freedom Square Developments; American Retirement Corporation; A.R.C. Management Corporation; ARC Management, LLC; Robert G. Roskamp; Frank Herold; (as to Freedom Square Nursing Center)*, Circuit Court of the Sixth Judicial Circuit in and for Pinellas County (Florida), Case No. 05-008209-CI, Division 011. 2009

On behalf of plaintiff's counsel, I reviewed discovery documents and submitted an affidavit.
- *Doe v. Doe* (Confidential) 2007–09

For plaintiff's counsel, I performed an analysis of Web sites and computer data for evidence of the mishandling of information. I submitted a report, was deposed, and testified at a pre-trial hearing. Case dismissed in favor of plaintiff.
- *Estate of Marjorie C. Belcamino, by and through Bank of America, N.A. as personal representative v. Labarc, L.P., et al. (As to Homewood Residence at Freedom Plaza)*, Circuit Court of the Thirteenth Judicial Circuit in and for Hillsborough County (Florida), Case No. 06-CA-009706, Division A. 2009

On behalf of defense counsel, I reviewed discovery documents and submitted an affidavit.
- *United States v. Thomas Ballato*, U.S. District Court, Southern Ohio, 3:06CR192 2008

For defense counsel I assessed evidence brought by the government and submitted an expert report.
- *John W. Ferron v. Search Cactus, LLC, et al.*, United States District Court for the Southern District of Ohio, Eastern Division, Civil Action No. 2:06-cv-327 2008

For defense counsel I consulted on ESI and computer technology. I submitted two declarations for the Court.
- *Jesse Land, II, Paula Land and the Land Companies of Kentucky, LLC v. Farmers State Bank and Harvey Hensley, Owsley Circuit Court [Kentucky]*, Civil Action No. 05-CI-216 2008

For defense counsel, I led analysis of computer data for consistency with proffered testimony of parties to the litigation. I submitted two expert reports.
- *Chornyak & Associates Ltd. v. Richard D. Nadler, Everhart Financial Group, Inc. and R. Scott Everhart*, Franklin County [Ohio] Court of Common Pleas, 05 CV 011942 2005–08

Submitted reports on forensic analysis of a computer system to determine recent activity, conducted electronic discovery of defendants' systems, reported findings in writing, and provided testimony at trial.
- *City of Cuyahoga Falls v. Jamil T. Kazoun*, Cuyahoga Falls [Ohio] Municipal Court, 2007CRB00200 2007

Performed analysis of computer data and testified at trial regarding findings.

- *Justin Bunnell, et al. v. Motion Picture Association of America* 2007

Performed computer system analysis and submitted an expert report on behalf of the Bunnell parties and was consequently deposed. Technical issues at hand involved the analysis of email systems and networking.
- *State of Ohio v. Justin Blaney* 2006

Analyzed state's evidence around the issue of electronic contraband on behalf of the defendant. That analysis included examination of digital photograph data and operating system data. I provided an expert report and in-court testimony in a pre-trial hearing on the admissibility of certain digital evidence.
- *Frank E. Bellamy, Sr. v. Robert G. Montgomery, et al* 2005

Led the forensic analysis of computer system and rendered opinion regarding the system's rôle in the creation of a printed message. The analysis included reconstruction of data intentionally "wiped" to destroy evidence.
- *Pharmatrak Privacy Litigation*, United States Court of Appeals, First Circuit. 329 F.3d 9 2001-03

Led electronic discovery and forensic data analysis for plaintiff's counsel of Pharmatrak's systems to determine whether and how personal information was intercepted by a third party. Opinion used by the Court to establish precedent on the application of the Electronic Communications Privacy Act (ECPA) to Web technology.
- *RIAA v. MP3Board.com* 2001

Provided a technical expert report on behalf of MP3Board.com, an Internet search engine in its defense against the Recording Industry Association of America and was cross-examined by RIAA counsel.
- *Avenue A Privacy Litigation* 2001

Performed technical analysis of Avenue A electronic advertising systems and provided an expert report on behalf of plaintiff in this early online privacy litigation.

Presentations

When Cryptography is Outlawed Philosophy 1337, Guest lecture in the Department of Philosophy at The Ohio State University, April 8, 2014.

Columbus, Ohio

Discussed surveillance of citizens, access and use of cryptography as a countermeasure in the context of the mid-1990s “Crypto Wars,” as seen retrospectively after revelations of NSA’s domestic surveillance programs.

Putting the Science in Computer Science: Applications from Boardrooms to Courtrooms

Franklin University, March 26, 2014.

Columbus, Ohio

Showed the application of computer science to important problems in management and dispute resolution for students in the Choose Ohio First scholarship program.

Cracking the Code Hawken Middle School, January 30, 2014.

Cleveland, Ohio

Discussed the development and operation of a large-scale distributed computing system from idle cycles of computers to find the key needed to read an encrypted message.

Big Data Panel Discussion Columbus Chapter of the International Legal Technology Association, November 7, 2013.

Columbus, Ohio

Discussed issues with “big data” in the context of litigation with litigation support professionals as part of a panel.

Mobile Devices: Evidentiary Gold Mine or Empty Mine Shaft?

Columbus Chapter of (ISC)², October 14, 2013.

Columbus, Ohio

Presented uses and applications of data recovered from mobile devices in the context of adjudication at a training event for information security professionals.

Putting the Science in Computer Science Keynote Talk, Midwest Consortium for Computing Sciences in Colleges Conference, September 20, 2013.

Findlay, Ohio

Showed the application of computer science to important problems in management and dispute resolution for students and instructors of computer science.

Data Analysis to Find Fraud Ohio Association of Student Financial Aid Administrators, Spring Conference, May 7, 2013.

Columbus, Ohio

Discussed the issue of fraud particularly in connection with student loans and how data analysis can help to identify fraud more effectively and at lower cost.

Building and Maintaining Incident Response Capability Central Ohio INFOSEC Summit, May 3, 2013.

Columbus, Ohio

Copresented with Keith Fricke how an organization can respond effectively to information security incidents. Showed the factors leading to success in the development and maintenance of those programs.

ESI in Employment Litigation Ohio Management Lawyers' Association, April 19, 2013.

Columbus, Ohio

Showed methods to address the management and use of electronically stored information in employment and labor disputes, including strategies to make electronic discovery in litigation more cost-effective.

Integrity in Digital Evidence: Rendering Judgment on an Electronic Record

Central Ohio Association of Criminal Defense Lawyers, February 27, 2013.

Columbus, Ohio

Discussed adversarial data analysis to identify weak and missing foundation in arguments made to the court presumably upon the basis of scientific analysis, as well as common scientific errors committed by investigators of digital evidence.

Cracking the Data Encryption Standard Telecommunications Systems Management Association, February 26, 2013.

Athens, Ohio

Presented the design and implementation of a large-scale computing capability to break a message encrypted with the U.S. Government standard for Data Encryption.

Discovery in the Cloud Ohio Bar Association CLE, December 13, 2012.

Columbus, Ohio

Copresented with attorney Mason Evans on the topic of conducting electronic discovery of Internet "cloud" services and use of the data in litigation.

Case Study in Incident Response Northern Ohio Chapter of InfraGard, December 7, 2012.

Cleveland, Ohio

Gave an inside look at identification and response to a security incident, showing lessons learned and how organizations can be better prepared to ensure effective incident response capability.

Applications of Open Source Software OpenSource Club at The Ohio State University, November 8, 2012.

Columbus, Ohio

Showed students how "open source" software—where source code is available—has applications beyond the word of hobbyist. Identified where expert analysis with detailed discussion of method benefits from the use of open source software.

Information Security in Law Firms Ohio Chapter of the International Legal Technology Association, November 8, 2012.

Columbus, Ohio

Participated in a panel discussion of information security and the specific issues that arise for law firms, highlighting critical concerns and strategies for addressing them.

Case Study in Incident Response Central Ohio Chapter of the Information Systems Security Association, October 12, 2012.

Columbus, Ohio

Gave an inside look at identification and response to a security incident, showing lessons learned and how organizations can be better prepared to ensure effective incident response capability.

Maintaining Security During a Crisis Contingency Planners of Ohio Annual Conference, October 15, 2012.

Columbus, Ohio

Copresented with Shawn Sines on how an organization in crisis adopting emergency modes of operation can maintain information security standards to avoid exacerbating a high-risk event.

Successfully Handling Data Breaches State of Ohio Cyber-Security Awareness Event, October 2, 2012.

Columbus, Ohio

Showed how data breach events can be handled successfully to ensure that disruption to the organization is no greater than necessary and that those affected can have their concerns addressed.

Compromise in the Cloud Central Ohio Information Systems Security Association, April 18, 2012.

Columbus, Ohio

Offered a case study on responding to an information security incident surrounding the compromise of a cloud-based service. Included discussion of challenges and opportunities in forensic analysis of remote systems.

Careers in Information Assurance University of Findlay, April 13, 2012.

Findlay, Ohio

Discussed career options within the field of information assurance, including paths in and playing to strengths to advance.

Electronic Medical Records and Off Site Interface OSHRM Winter Conference, March 9, 2012.

Columbus, Ohio

Copresented with attorney Greg Krabacher on the functional and liability concerns of medical records for the Ohio Society for Human Resource Management State Council winter conference. Included discussion of original format records compared to those produced by applications.

Incident Response Central Ohio Association of Corporate Council, February 28, 2012.

Columbus, Ohio

Discussed how organizations can prepare for and execute well during a security incident to contain and to limit the impact of an incident. Part of a data breach seminar.

Analyzing ESI in Litigation Central Ohio Association for Justice, January 17, 2012.

Columbus, Ohio

Showed attorneys how use of a computer expert offered new insights into electronic medical records at the basis of adjudication arising from claims of medical malpractice and related concerns.

Defending Your Agency on the Internet and in the Courtroom Cyber Security Symposium, State of Ohio, October 5, 2011.

Columbus, Ohio

Discussed security incidents in the context of the legal systems of chief information officers of agencies of the State of Ohio.

Drilling to Perfect Data Incident Response Ohio Network for Healthcare Information Assurance, September 22, 2011.

Columbus, Ohio

Showed how organizations can prepare for unplanned high-impact events such as security incidents for information assurance professionals in the healthcare industry.

Defensible Forensic Collection Ohio Chapter of International Legal Technology Association, September 12, 2011.

Columbus, Ohio

Presented to legal support professionals the elements of a defensible acquisition of data to be used for forensic analysis, showing both procedural and technical issues to address.

Integrity in Digital Evidence Ohio Judicial College, September 9, 2011.

Columbus, Ohio

Showed the use and interpretation of digital evidence for the annual conference of the Ohio Judicial College, focusing on how trial judges can identify gaps in foundation.

Drilling to Perfect E-Discovery Technology First Seminar, June 8, 2011.

Dayton, Ohio

Discussed the process of electronic discovery and the demands of the courts to ensure a good record, and how to use full-scale exercises to ensure effective capability.

Cloud Computing: Navigating the Legal Fog Ohio State Bar Association Annual Meeting, May 5, 2011.

Columbus, Ohio

Copresented with attorney Alan Wernick on the issues raised by cloud computing and how to address them. Moderated by attorney Karen Hockstad.

Persuasively Rebutting Opposing Experts' Opinions SEAK

National Expert Witness Conference, April 15, 2011.

Naples, Florida

Discussed how rebuttal testimony can be presented persuasively to experts in a wide variety of disciplines.

Electronic Health Records American Bar Association Business Law Section Spring Meeting, April 14, 2011.

Boston, Massachusetts

Participated in a panel discussion with attorneys looking at various aspects of electronic health records. Focused presentation on the nature of electronic information and how expectations may now be at odds with reality.

Making Best Use of Experts Guest Lecture, Case Western Reserve University School of Law, March 28, 2011.

Cleveland, Ohio

Discussed the use of experts with law students focused on criminal defense issues.

Health Care Incident Response HIMSS¹¹ Conference, February 22, 2011.

Orlando, Florida

Presented how to address response to security incidents in the context of healthcare at the HIMSS annual conference.

Data Breach: Staying Out of the Headlines Breakfast Club, Fisher College of Business at The Ohio State University, February 5, 2010.

Columbus, Ohio

Presented results of five-year study of reported data breaches and discussed implications for business leaders and information security practitioners.

Compliance in Privacy and Data Security: How to Avoid Liability Columbus Bar Association, December 14, 2009.

Columbus, Ohio

Copresented CLE seminar with Benita Kahn, Esq. on the intersection of law and technology of information security and privacy.

Using Science to Combat Data Loss Information Security Compliance and Risk Management Institute, University of Washington, September 16, 2009.

Seattle, Washington

Presented recent research using statistical analysis of breach data at seminar entitled "The Changing Environment of Information Security: Dealing with New Technologies, New Threats, and New Laws."

- The New Age Toolset** CIO Solutions Gallery, Fisher College of Business, The Ohio State University, August 12, 2009
Columbus, Ohio
Part of program “Security Summit: Challenges to Our Future State of Readiness,” discussing the rôle of scientific analysis of data in the management of corporate information technology.
- The State of Data Loss** IT Leadership Academy Value Studio 16, Florida State College at Jacksonville, August 6, 2009
Jacksonville, Florida
Part of program “The State of . . . : Where Are We Today, and Where Are We Going?” Discussed how and where data loss events occur, and how to prioritize defensive resources.
- Incident Handling: Sensitive Data Breach** Columbus CIO Forum, July 23, 2009
Columbus, Ohio
Part of panel discussion on information security for area chief information officers.
- Hands-On Incident Response Testing** RSA Conference, April 21, 2009
San Francisco, California
Presented work with Keith Fricke of the Cleveland Clinic Health System on preparing security incident response teams using drills.
- Using Science to Battle Data Loss** Multiple presentations of state breach notification laws and analysis of subsequently-available breach data.
American Bar Association Information Security Committee Meeting, July 29, 2009
Chicago, Illinois
RSA Conference, April 23, 2009
San Francisco, California
- Computer Science Education: Industry View** Franklin University, April 17, 2009
Columbus, Ohio
Part of panel discussion on the state of computer science education, its value and relevance to future careers in computer science and information technology.
- Implications of Litigation in Virtualization** CIO Solutions Gallery, April 1, 2009
Columbus, Ohio
Discussed issues arising from litigation on a panel discussion on virtualization of computing infrastructure. Part of program “Advancing Your Competitiveness in a Recessive Economy.”
- Uses and Limits of Forensic Data Analysis** Ohio Investigators Association, March 25, 2009
Columbus, Ohio

Led discussion of applications of forensic analysis of computer data, including case studies in criminal and civil matters.

Discovery Beyond Documents Defense Research Institute Medical Liability and Health Care Seminar, March 12, 2009

Lake Buena Vista, Florida

Presented a case study of computer database analysis in wrongful death litigation and methods to prepare for litigation involving electronic information.

Asking the Right Questions: Forensic Analysis of Data Alternatively entitled, "How to Make BlackBerry Data Hearsay." Multiple presentations of recent research work on forensic analysis of mobile phones, with a focus on BlackBerry devices.

Central Ohio InfraGard Members Alliance, January 28, 2009

Columbus, Ohio

Cleveland InfraGard Members Alliance, December 12, 2008

The Next Twenty-Five Years: Applications of Computer Science

Franklin University TechConnect, January 26, 2009

Cleveland, Ohio

Addressed the widely-held belief that information technology is changing so rapidly as to make technical education models obsolete.

Columbus, Ohio

Using Information to Focus Resources "When, Why, and How to use Computer Experts." Columbus Bar Association, December 9, 2008 and December 9, 2009.

Columbus, Ohio

CLE program on the use of computer experts in litigation.

E-Discovery and the Issues Related to Storage of Information

Delaware CIO Forum, December 5, 2008

Delaware, Ohio

Presented case studies on how electronically stored information (ESI) has come into scope of public records requests and litigation.

Electronic Evidence in Criminal Defense Columbus Bar Association, November 20, 2008

Columbus, Ohio

Discussed issues of data analysis unique to criminal defense attorneys, including critical analysis of law enforcement reports, and the use of experts for rebuttal or to prepare for cross-examination.

Electronic Discovery—Cleveland Clinic's Mock Exercise (Panel)

Cisco Systems Cleveland CSO Roundtable, November 18, 2008

Richfield, Ohio

Discussed three years' of incident response drills at the Cleveland Clinic Health System to prepare for security incidents and litigation events. Copresented with CCHS Chief

Information Security Officer Mark Dill and CCHS East Data Security Administrator Keith Fricke.

When to Hire a Computer Expert Witness Columbus Bar Association, November 14, 2008

Columbus, Ohio

CLE presentation on finding, retaining, and effectively using computer expert witnesses in litigation.

Hands-On Incident Response Testing Contingency Planners of Ohio Annual Conference, September 30, 2008

Lewis Center, Ohio

Presented work with Keith Fricke of the Cleveland Clinic Health System on preparing security incident response teams using drills.

Expert Witness Appearance (Mock Trial) ASTAR 2008 National Judge's Science School (JSS), Advanced Forensic Technologies, September 25, 2008

Columbus, Ohio

Acted as an expert witness discussing computer technology and findings from analysis of computer data relating to a computer intrusion in a mock trial.

Building a Successful Organization Capital Square Rotary Club, July 15, 2008

Columbus, Ohio

Discussed observations from experience in developing organizations that succeed in advancing their objectives and growing beyond the individual capabilities of the founders.

Hands-On Incident Response Testing Ohio Regional Information Security Conference, March 18, 2008

Dayton, Ohio

Copresented incident response drills with Keith Fricke of the Cleveland Clinic Health System.

A Taxonomy of Recent Data Losses Central Ohio ISSA, February 20, 2008

Columbus, Ohio

Copresented data loss incident research colleague Lee Ayres to a local group of information security practitioners.

Tech101: Electrons Are the New Paper Revised edition of earlier lectures on use of electronic information in adjudication.

July 14, 2008 CLE presentation for Dayton Bar Association

Dayton, Ohio

July 5, 2008 CJE presentation for Wisconsin Appellate Court Specialty Seminar

Pewaukee, Wisconsin

May 28, 2008 CLE presentation for Lake County (Ohio) Bar Association

Painesville, Ohio

- April 24, 2008** CLE presentation for Columbus (Ohio) Bar Association, marketed as “Paper As Obsolete: What Every Lawyer Should Know about Information Technology and E-Discovery”
Columbus, Ohio
- January 16, 2008** One-hour CLE presentation for Warren County (Ohio) Bar Association
Lebanon, Ohio
- November 28, 2007** Three-hour CLE presentation for Columbus (Ohio) Bar Association
Columbus, Ohio
- Confessions of a Plaintiff’s Expert** Toledo InfraGard Members Alliance, December 7, 2007
Toledo, Ohio
- Identity Management, Fraud, and Forensics in the 21st Century** CIOhio 2007, November 15, 2007
Columbus, Ohio
Discussed forensic computer analysis and its rôle in addressing misappropriation of intellectual property.
- Evolution of Backup Technology** 3X Seminar, November 13, 2007
Columbus, Ohio
Keynote presentation for 3X product launch, showing history of data backup and disaster recovery technology, challenges facing today’s IT managers, and solutions for the future.
- Intrusion Detection and Prevention Technology and Strategy** CIO Circle, November 7, 2007
Cincinnati, Ohio
Discussion of evolution of technology for intrusion detection and prevention systems (IDPS), its relationship with other security technologies, and limits of IDPS.
- Beyond Tabletop: Hands-on Incident Response Training** Information Security Summit, November 2, 2007
Independence, Ohio
Presentation on security incident response drills as training exercises at the Cleveland Clinic Health System, with Keith Fricke of CCHS East Region.
- The Rôle of Security in Clinical Informatics** Keynote presentation for the Central and Southern Ohio Chapter of HIMSS, November 2, 2007
Columbus, Ohio
Discussed how information security in clinical information systems supports good patient care.
- Handling Electronic Information** Ohio State Bar Association Midwest Labor Law Conference, October 26, 2007
Columbus, Ohio
Panel discussion with Susan Hastings from Squire, Sanders, and Dempsey LLP and Pam Krivda of the Krivda Law Offices.

- Consultant Residue** Third Annual Information Assurance Forum at the University of Findlay, October 24, 2007
Findlay, Ohio
Case study discussing the impact of data being brought into an ERP installation by a consultant from a previous ERP installation in the consultant's practice.
- The Cost of Misappropriation** Third Annual Information Assurance Forum at the University of Findlay, October 24, 2007
Findlay, Ohio
Case study involving the analysis of systems to identify information from employees' former employers and elimination of the data.
- Why Information Assurance?** Max M. Fisher College of Business at the Ohio State University, October 11, 2007
Columbus, Ohio
Lecture for visiting Chinese IT Executives on how an information assurance program supports enterprise risk management.
- TechTalk: Breach Notification** Central Ohio chapter of ISSA and TechColumbus, July 26, 2007
Columbus, Ohio
Discussion on data breach notification trends, strategies, and technologies.
- Computer Technology in Adjudication** Advanced Science and Technology Adjudication Resources (ASTAR) Conference, June 29, 2007
Columbus, Ohio
Lecture for regional judges' conference. Discussed electronic data storage and related issues for judges from eleven states.
- Tech101: How Computers and Data Work** Ohio State Bar Association (OSBA) Annual Convention, May 18, 2007
Cincinnati, Ohio
Discussion of the use of computers and electronic data in civil litigation in the context of new Federal Rules for Civil Procedure on electronic discovery.
- Addressing the Needs of Technology Education** itWORKS.OHIO Annual Conference, organized by the Ohio Department of Education, April 19, 2007
Columbus, Ohio
Part of panel discussion regarding technology jobs of the future and how the education system can prepare students for them.
- Forensic Computing: The Intersection of Law and Technology** Center of Science and Industry (COSI), March 26, 2007; October 30, 2007.
Columbus, Ohio

Discussion of forensic computing for high school students across the country, delivered over the Internet with H.323 link from Columbus.

Careers in Forensic Computing Columbus State Community College, November 17, 2006

Columbus, Ohio

Demonstration and lecture on computer science in a legal context for statewide conference for girls in grades 7–10 with an interest in careers in science and technology.

Careers in Cryptography Edison Community College, October 6, 2006; November 16, 2007

Piqua, Ohio

Demonstration and lecture on cryptography and its applications for pilot of statewide conference for girls in grades 7–10 with an interest in careers in science and technology.

Careers in Forensic Computing Edison Community College, October 6, 2006; November 16, 2007

Piqua, Ohio

Demonstration and lecture on computer science in a legal context for pilot of statewide conference for girls in grades 7–10 with an interest in careers in science and technology.

Cryptographic Protection of Data Warehouses Web presentation for NCR Teradata customers, August 3, 2006

Columbus, Ohio

Discussion of the protection of Enterprise Data Warehouse systems with cryptography.

Electrons are the New Paper Keynote Lecture, ASTAR Conference, May 19, 2006

Columbus, Ohio

Keynote lecture for the Ohio judges' Advanced Science and Technology Adjudication Resources (ASTAR) conference on computer science and related technology.

Computer Forensics: A Case Study of Data Analysis in a Criminal Trial

ASTAR Conference, May 19, 2006

Columbus, Ohio

Discussion of work in recent criminal defense as a case study for data analysis gone awry by investigators and overzealous prosecutors for the Ohio judges' Advanced Science and Technology Adjudication Resources (ASTAR) conference on computer science and related technology.

How the Internet and Cyberspace Works Presentation on fundamentals of Internet architecture and critical issues for analysis of data in legal proceedings. Presented to a variety of audiences.

May 18, 2006 ASTAR (Advanced Science and Technology Adjudication Resources) Conference,

Columbus, Ohio

- May 17, 2006** INFOSEC Forum VIII, Central Ohio ISSA Columbus, Ohio
- April 25, 2006** itWORKS.OHIO Information Technology Educators Conference Columbus, Ohio
- April 21, 2006** Colorado Bar Association Denver, Colorado
- March 27, 2006** Greater Dayton IT Alliance Legal IT Peer Group Dayton, Ohio
- March 14, 2006** Greater Dayton IT Alliance D-RISC Dayton, Ohio
- Implications of Digital Rights Management** The Privacy Foundation at the Sturm College of Law at the University of Denver, February 10, 2006
Discussion of Digital Rights Management systems including the XCP (“rootkit”) system shipped on some Sony CDs in 2005. Denver, Colorado
- Identity Theft** Central Ohio ISSA, January 18, 2006
Panel discussion including other members of the Central Ohio ISSA on identity theft and related fraud, presented by TechColumbus and Platform Lab in Columbus. Columbus, Ohio
- Cryptographic Key Management** Cedarville University Guest Lecture, September 8, 2005
Guest lecture for course on models for key management, including both centralized Public Key Infrastructure (PKI) and the decentralized PGP “web of trust” model. Columbus, Ohio
- Tales of a Forensic Computist** Central Ohio InfraGard Members Alliance, August 2, 2005
Presentation giving personal experience on becoming a litigation consultant and expert witness as well as some recent casework. Columbus, Ohio
- Compliance in the Courtroom** Security And Technology Online (SATO) Web conference, April 28, 2005
Part of panel discussing the intersection of law and technology. Specifically discussed the Pharmatrak Privacy Litigation and how the court used and interpreted data. Columbus, Ohio
- Observing hidden surveillance structures** Computers, Freedom and Privacy (CFP 2005) conference, April 14, 2005
Panel discussion themed “Panopticon.” Discussed Web architecture and the side-effects of relevant protocols, database designs, and practices that affect the privacy of unsuspecting users. Seattle, Washington

Thinking About the Box Keynote talk for itWORKS.OHIO conference, April 5, 2005

Columbus, Ohio

Keynote for teachers of technology programs in secondary and vocational schools throughout the state of Ohio. Discussed requirements for an educational system that prepared students for successful careers in technology.

The Fall of the Data Encryption Standard Greater Dayton IT Alliance, March 15, 2005

Dayton, Ohio

Discussion of the DESCHALL Project that broke a message encrypted with the Data Encryption Standard for the first time in 1997 and its impact on cryptographic policy in the United States.

The Business Case for Security Eastern Ohio Health Information Management Association, February 26, 2005

Independence, Ohio

Discussed how to balance business objectives and risks in light of the HIPAA Security Rule.

Electronic Discovery Columbus Bar Association Technology Committee, January 19, 2005

Columbus, Ohio

Discussion of electronic evidence and e-discovery issues.

HIPAA Security: Making HIM Work Ohio Health Information Management Association (OHIMA) fall Seminar, November 12, 2004

Columbus, Ohio

Discussion of how the HIPAA Security Rule affects health information management (HIM), along with strategies for achieving compliance.

Wireless Security Information Assurance Forum at the University of Findlay, October 28, 2004

Findlay, Ohio

Technical discussion of the IEEE 802.11 wireless networking standards and securing information in wireless networks.

The Rise and Fall of the Data Encryption Standard Information Assurance Forum at the University of Findlay, October 28, 2004

Findlay, Ohio

Presentation on the history of standardized encryption, exhaustive key-search attacks in general, and the ultimate defeat of the U.S. Government standard for data encryption, DES.

Intrusion Detection Technology Security And Technology Online (SATO) Web Conference, October 28, 2004

Findlay, Ohio

Considered strategies and tactics for identification and management of security events.

- Privacy in a Digital World** Privacy Foundation at the Sturm College of Law at the University of Denver October 22, 2004
Denver, Colorado
Discussion of how electronic infrastructures affect individual privacy.
- Strengthening Anti-Spam Defenses with Message Authentication** eWEEK's Anti-Spam eSeminar, September 20, 2004
Columbus, Ohio
Focused on the use of authentication mechanisms in present and possible future Internet email architectures.
- Spying on Spyware** Central Ohio ISSA, July 21, 2004
Columbus, Ohio
Presentation on identifying and managing spyware: dissecting how it works, motivations behind its creation, and discussion of my work in *In re Pharmatrak Privacy Litigation* and how that has affected the legal standing of spyware.
- Security is Economics!** Security Work Group of the Infrastructure & Interoperability Subcommittee of the Supreme Court of Ohio Advisory Committee on Technology and the Courts, July 20, 2004
Columbus, Ohio
A high-level introduction to information security for the first meeting of the work group.
- Cyber & IT Workshop: Beyond Firewalls** "Protect Your Network from Intrusion," Security & Technology Online (SATO) Security Leadership Council, June 30, 2004
Columbus, Ohio
Panel discussion arguing for rational and strategic management of risks to information systems.
- Privacy & Data Governance Technology Landscape** International Association of Privacy Professionals, Privacy Futures Conference, June 10, 2004
San Francisco, California
Panel discussion on technology to enforce privacy policy and regulatory compliance.
- Planning to Fail: Continuing to Get It Wrong** Keynote lecture for Security Week at The Ohio State University, April 26, 2004
Columbus, Ohio
Argued that the present focus on treating security as a tactical matter is doomed to fail.
- Forensic Computing Process and Applications** Guest Lecture, University of Findlay, April 14, 2004
Findlay, Ohio
Discussion with information assurance class at the University of Findlay, covering investigative procedure, working with attorneys, handling digital evidence, and case studies.

- The Business Case for Security** Columbus Board of Realtors' Tech User Forum, March 23, 2004
Columbus, Ohio
Discussed how to balance business objectives and risks, with focus on small business.
- CTC Techtalk** "Identity Management—Strategic Security Lever and 5x ROI?," March 17, 2004
Columbus, Ohio
Panel discussion regarding identity management from IT and information security perspectives.
- HIPAA Security Rule Implementation** Seminar, March 9, 2004
Columbus, Ohio
A full-day seminar presented in coöperation with a practicing attorney with experience in Health Care regulation and administration. A standard-by-standard consideration of the Security Rule, how the technology is to be understood and integrated with policy and procedure.
- From the War Room to the Board Room** "Translating Between Information Security and Risk Management" (Panel Moderator). Central Ohio Chapter of the Information Systems Security Association, November 5, 2003
Columbus, Ohio
Moderated a panel discussion with chief security officers from large regional companies discussing integration of information security into operations and translating risk management objectives into strategy for information security practice.
- Confessions of a Hacker** Association for Computing Machinery Chapter at The Ohio State University, October 7, 2003
Columbus, Ohio
A discussion of computer science, the computing profession, and career development in computing technology. Included personal history and anecdotes for students to understand how to manage their own career growth.
- Introduction to HIPAA Security Rule and Risk Management** Cleveland Clinic Health System, August 7, 2003
Columbus, Ohio
Presentation and Q&A session with Security Teams covering the HIPAA Security Rule's main objectives and general mechanisms for achieving them, followed by a more detailed look at mechanisms for Risk Management in information systems.
- Information Security in Health Care** Children's Hospital, June 25, 2003
Columbus, Ohio
"Brownbag lunch" with HIPAA Security Rule implementors and stakeholders discussing INFOSEC's goals and how security can be built into operational processes.

- Forensic Computing for Computer Professionals** Seminar, June 16–17, 2003
Columbus, Ohio
Development and presentation of a two-day corporate training course in forensic computing. Covered handling of computer forensic investigations, filesystem and network technology. Led the course through a hands-on forensic challenge, extracting evidence from a disk image.
- Communication: The Key to Fraud Prevention** Emerging Trends in Fraud Conference, May 9, 2003.
Columbus, Ohio
Considered the problems in information systems auditing, how fraud examiners, auditors, and information systems experts must establish a common vocabulary and work together to combat fraud successfully.
- Computer and Network Security** InfraGard Panel for Columbus ITEC 2002, October 29–30, 2002
Columbus, Ohio
Discussion of computer security, with particular focus on corporations and what they can do to secure their infrastructures.
- Making the Case for CyberSecurity in Times of Austerity** Second Columbus INFOSEC Forum, October 23, 2002
Columbus, Ohio
Expert panel discussion of computer and network security: how to identify and to quantify its business value.
- Forensic Data Analysis** Northeast Ohio ISACA, October 17, 2002
Brecksville, Ohio
Consideration of the problem of forensic analysis with electronic and computer data.
- Security Vulnerability Assessments** Privacy2002 Conference, September 25, 2002
Cleveland, Ohio
Participated in a “how-to” panel, considering of live penetration tests, how they are performed, what can be expected, and which problems they do not solve.
- Getting to Know You** Privacy2002 Conference, September 25, 2002
Cleveland, Ohio
Discussed trends in surveillance technology, upsides and downsides for privacy and security online and offline. Covered surveillance technologies, biometrics, computer profiling, video, and wireless monitoring.
- Requirements for a Secure Infrastructure** Multiple presentations of a discussion of securing the U.S. information infrastructure against attack and proposal of set of requirements for a workable security plan.
Dayton, Ohio
Columbus, Ohio

Dayton InfraGard, September 18, 2002
Columbus InfraGard, November 25, 2002

Is Computer Security Possible? Columbus Computer Society,
May 22, 2002
Columbus, Ohio

Discussed the problem of computer security, specifically what computer security is, how privacy and security are related, typical security failures, and what can be done to improve security in computing. Argued that the best end-user defense against attack is awareness and mindset, and a demand for trustworthy systems from vendors.

Internet Security (An Overview) Central Ohio Craftsmen Club,
April 11, 2002
Columbus, Ohio

Consideration of how technology has altered the printing industry, what business requirements are present in Internet systems, and how the issue of security can be managed proactively.

Cryptography in Practice Central Ohio Chapter of InfraGard,
March 11, 2002
Columbus, Ohio

Discussion of cryptography, what it can and cannot do, and how it affects the ability to defend against attack and to perform forensic data analysis.

Assessing Risk in Information Systems Central Ohio Chapter of the Information Systems Security Association, March 6, 2002
Columbus, Ohio

Consideration of information technology, information theory, and risk management theory.

Getting Security Right Keynote Address at First Columbus INFOSEC Forum, February 21, 2002
Columbus, Ohio

Discussed the facets of information security, the requirements of businesses, and how INFOSEC managers can succeed.

Privacy and Security Gotchas Columbus Computer Society's Consulting SIG, January 9, 2002
Columbus, Ohio

Discussion of how side-effects can have unintended consequences when the technology is not fully understood.

The Relationship Between Privacy and Security Privacy By Design Conference, December 3, 2001
Montréal, Québec, Canada

Discussion of privacy failures in public Web-based services, based on research work of Interhack's Internet Privacy Project.

Computer System Security InfraGard panel at Columbus ITEC Show, October 30–31, 2001

Columbus, Ohio

Discussion of system security, particularly as it relates to resistance against widespread attack against the U.S. infrastructure.

Auditing Computers? Are You Serious? Central Ohio Chapter of the Information Systems Audit and Control Association, October 11, 2001

Columbus, Ohio

Consideration of requirements for system auditing and a review of current commercial technology's ability to address those requirements.

Dodging the Security Bullet Workshop at Privacy 2001 Conference, October 4, 2001

Cleveland, Ohio

Participated in workshop subtitled "Tools to Secure Business Data in a Competitive Environment," discussing tools and techniques available to enhance security in information systems.

Creating Your Business' Privacy Policy Privacy 2001 Conference, October 3, 2001

Cleveland, Ohio

Participated in workshop addressing the problems in privacy, how business needs must include consumer privacy, and how to find the define the right policy for the organization.

CyberCrime in the Workplace Panel in the 10th Annual Ohio Employment Law Conference, May 9, 2001

Columbus, Ohio

Discussion of the rôle of good business process specification and system design in managing risk in the workplace, especially with regard to criminal activity online.

Internet Security: Are We Ever Going To Get It Right? Keynote presentation at InterLab 2000 Conference,

Los Alamos, New Mexico

Keynote presentation on information security in computing technology delivered in Los Alamos and broadcast to other National Laboratories around the United States.

Banner Advertising Networks A detailed discussion of how Web-based banner advertising services work and how they are used to violate the privacy of unsuspecting Web users. Presented for various private clients and organizations at The Ohio State University.

New York, New York

Columbus, Ohio

Articles

Using Electronic Stored Information *Columbus Bar Lawyers Quarterly*, Spring 2008

Article for publication of the Columbus (Ohio) Bar Association describing the fundamentals of electronic information.

Introduction to Forensic Computing *Control*, May 2006

Feature article for the journal of the Information Systems Audit and Control Association (ISACA) introducing forensic computing through three brief case studies.

The Road to HIPAA Security Rule Compliance *Security, Technology & Design*, November 18, 2004

Article written with attorney Peter M. Hazelton introducing information security practitioners to the HIPAA Security Rule.

Security is a matter of guns and butter *Healthcare IT News*, November 2004

Published interview by editor Jack Beaudoin, discussing information security strategy and the economics behind effective information security.

New HIPAA rule requires rugged security framework *BusinessFirst* (Columbus), October 15, 2004

Article written with attorney Peter M. Hazelton on the Health Insurance Portability and Accountability Act (HIPAA) Security Rule, with focus on building information security programs for regulatory compliance.

Consumers should demand security when using Internet *Columbus Dispatch*, January 28, 2002

Discussion of the problem with Internet security and how consumers can improve security.

Hackers Lovebugs & Saboteurs: Who'll Protect Your Computers? *Columbus CEO*, Roundtable, November 2000

Published discussion with five other experts, which ran as an article.

Preserving Integrity *WebTechniques*, May 2000

A discussion of secure programming practices, especially as they relate to the Web.

On Guard *WebTechniques* April 2000

Describing the essentials of Web site security to site builders.

Electronic Snake Oil ;login:, April 1999

How non-cryptographers on identifying likely bad cryptography products.

A Brute-Force Search of DES Key Space ;login:, May 1998

Described the technical workings of the DESCHALL project.

Write Once, Run Anywhere: Why It Matters An essay on the importance and the achievability of the goal of having software work on any type of computer. Featured on Sun's <http://java.sun.com/> Web site in January 1998.

PreText Magazine 'Forum' November 1997

Took part in a forum discussing individual consumer privacy vs. the needs of advertisers and marketers with a number of other experts in privacy, security, and marketing.

*Technical Reports***Analysis of Compact Disc Digital Rights Management** Interhack

Technical Report. Detailed analysis of various systems intended to prevent duplication of audio CDs, including alteration of disc geometry to take advantage of differences between audio CD players and CD-ROM drives.

Anatomy of Online Fraud: How Thieves Targeted eBay Users but Got Stopped Instead

Interhack technical report. Analysis of an online fraud scheme, how Internet technology was used to support the scheme, how the fraud was identified, reported, and halted.

Spector Professional Review and Commentary Interhack technical report. Analysis and discussion of "spyware" product Spector Professional. Discovered and documented hidden backchannel.

Comments on Guidelines on Securing Public Web Servers

Interhack technical report. Review and discussion of NIST draft document, *Securing Public Web Servers*. Covers Web security, drawing from such domains as information security, networking, software, and cryptography.

PCfriendly Enables DVD Backchannels Interhack technical report.

Analysis of popular Web-enabled DVD titles and privacy implications of "Internet" features, including discovery of surreptitious backchannel and analysis of data uploaded.

Bank One Online Puts Customer Account Information at Risk

Interhack technical report. Review and technical analysis of the design and implementation of an online banking application. Consideration of weaknesses, how they could be avoided, and how nonpublic customer information can be better protected.

A Failure to Communicate: When a Privacy Seal Doesn't Help

Interhack technical report. How a popular Internet privacy seal proprietor allowed a third party to monitor its site's visitors' activity on its Web site. Widely reported in the US media.

Getting to Know You (Intimately): Surreptitious Privacy Invasion on the E-Commerce Web

Interhack technical report. Discussion of the privacy ramifications of a third-party site usage analysis service and describing how four Internet retail sites' use of the system violated their privacy policies. Widely reported in nationwide print, radio, and television media.

Siralos: Xinu for Unix In progress. Description of the design and implementation of a UNIX runtime library that provides XINU-style system interfaces. Used in CIS762 at Ohio State's CIS department.

DoubleClick Opt Out Protocol Failure == Opt In

Interhack Technical report. How a failure to follow the HTTP protocol caused a popular Internet advertising service to ignore some "opt out" requests silently.

Opting In, By Accident Interhack technical report. How Netscape Communicator's handling of cookies can cause Web users who have "opted out" of advertising networks to be "opted in" again without their knowledge.

Why Anti-Virus Software Cannot Stop the Spread of Email Worms

Interhack technical report. Early consideration of malicious software ("malware"), analysis of the problem, and presentation of a strategy for addressing the risks.

Creating an Environment for Reusable Software Research: A Case Study in Reusability

Ohio State University Department of Computer Science and Engineering Technical Report OSU-CISRC-8/99-TR21. How applying the principles of reusable software to develop an environment for software research reaped a large reward.

"What's Related"? Everything But Your Privacy Interhack technical report. Exposed serious potential for privacy violation in Netscape's "smart browsing," which received publication

in Privacy Forum Digest, RISKS Digest, various Web marketing conferences, and widely through the German-language parts of Europe. Cited in a number of university courses in the US and at the “Cyberspace and Privacy” Symposium at Stanford Law School.

Firewalls FAQ Usenet Periodic Posting. Coauthored this official Usenet FAQ, archived around the Internet, and republished widely.

Snake Oil FAQ Usenet Periodic Posting. This monthly Usenet posting is widely recognized as the authoritative document on common practices among bogus cryptography products. Republished widely and used in courses at several universities.

Memberships

- Central Ohio InfraGard Members Alliance, Coordinated by Federal Bureau of Investigation.
- International Information Systems Security Certification Consortium (ISC²).
- American Radio Relay League (ARRL).
- Central Ohio Amateur Radio Emergency Services (COARES).
- Central Ohio Traffic Net (COTN), a part of the Ohio Section of the National Traffic System. Net Manager, 2014.
- FBI Cincinnati Citizens Academy Alumni Association

Certifications, Licenses, and Qualifications

- Certified Information Systems Security Professional (CISSP).
- Community Emergency Response Team (CERT), Franklin County, Ohio Emergency Management Agency & Homeland Security.
- Amateur Radio, KD8TTE.
- American Radio Relay League (ARRL) Official Relay Station (ORS).
- American Radio Relay League (ARRL) Official Emergency Station (OES).
- General Mobile Radio Service (GMRS), WQOV722.
- FEMA ICS 100, IS 700.

Languages

English (U.S. Native) and Russian (Student).

Education

Eastland Career Center, Electronic Data Processing, 1989–91.
Studied data processing, including COBOL, RPG-II, BASIC, OCL,
System/3x operations, accounting, and business.